

ORIGINAL

# OPEN MEETING



0000094700

## MEMORANDUM

Arizona Corporation Commission

DOCKETED

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2009 MAR 19 P 1:16

TO: THE COMMISSION

FROM: Utilities Division

DATE: March 19, 2009

MAR 19 2009

AZ CORP COMMISSION  
DOCKET CONTROL

DOCKETED BY

*MS*

RE: ARIZONA PUBLIC SERVICE COMPANY - APPLICATION FOR APPROVAL OF REVISIONS TO ITS RESIDENTIAL EXISTING HOMES HEATING, VENTILATION AND AIR CONDITIONING EFFICIENCY PROGRAM AS REQUIRED BY DECISION NO. 70666. (DOCKET NO. E-01345A-07-0712)

On January 16, 2009, the Arizona Public Service Company ("APS" or "the Company") filed revisions to its Residential Existing Homes Heating, Ventilation, and Air Conditioning ("HVAC") Demand Side Management ("DSM") program for Commission approval.

The Company's filing arose from obligations created in Decision No. 70666, December 24, 2008, in which the Commission approved APS' DSM Portfolio Plan Update for 2008 through 2010 with certain modifications, additions and requirements. One of the requirements was that "APS shall file a plan in Docket Control by January 16, 2009, to 1) promptly implement modifications to the Residential HVAC program that will return the program to cost-effectiveness, or 2) promptly replace the program with an alternate DSM program to benefit residential customers using funds allocated to the Residential HVAC program, or 3) terminate the program as promptly as possible."

## BACKGROUND

Under Commission Decision No. 67744, APS is obligated to spend at least \$16 million per year, or \$48 million over the initial three-year period of 2005 to 2007, on Commission-approved DSM programs. The Decision included an annual \$10 million in base rates for approved eligible DSM programs and related items. It further obligated APS to spend, on average, at least another \$6 million annually on approved eligible DSM-related items, such additional amounts to be recovered by means of a DSM adjustment mechanism.

On July 1, 2005, APS filed an application for approval of its DSM Portfolio Plan in response to APS' DSM obligations provided for in Commission Decision No. 67744. The Portfolio Plan included various DSM programs that would provide DSM opportunities for both residential and non-residential participants. APS filed revisions to its original filing on November 14, 2005, and November 21, 2005.

The Commission acted upon APS' proposed Portfolio Plan programs and activities in a series of decisions in 2005 and 2006. On August 17, 2005, the Commission approved the

lighting portion of APS' Residential Consumer Products program in Decision No. 68064. On February 23, 2006, in Decision No. 68488, the Commission granted interim approval for six APS Non-Residential DSM programs and further ordered APS to re-file the non-residential portion of its Portfolio Plan within 13 months ("13-month filing") for final Commission approval. On April 12, 2006, the Commission approved two additional APS' Residential programs in Decision No. 68648 and its Low Income Weatherization program in Decision No. 68647.

During 2007 and 2008, the Commission acted on various components of APS' 13-month filing. On August 28, 2007, the Commission rendered Decision No. 69879 for expedited approval of certain time-sensitive initiatives contained in its 13-month filing. On December 4, 2007, the Commission rendered Decision No. 70033 in response to the residential components of the Company's 13-month filing. Decision No. 70637, December 11, 2008, granted final approval for five of APS' six Non-Residential programs as well as a large number of changes and enhancements to improve the programs based on actual program experience and performance.

On December 24, 2008, in Decision No. 70666, the Commission approved APS' DSM Portfolio Plan Update for 2008 through 2010 for ongoing operations of the programs with certain modifications, additions, and requirements.

## **OVERVIEW OF THE RESIDENTIAL HVAC PROGRAM**

The APS Residential HVAC program is an ongoing Commission-approved DSM program. It is one of four Residential programs in APS' Portfolio Plan. The program promotes the replacement of both split and package whole-house air conditioners and heat pumps in existing homes with energy-efficient replacement equipment. The program also has separate measures 1) to promote Quality Installation ("QI") of replacement equipment and 2) to promote repair and replacement of leaking duct systems.

The Residential HVAC program is being addressed at the present time to deal with its cost-effectiveness. New information suggests that the program's equipment replacement measures result in less energy and demand savings than was earlier believed. Therefore the measures are no longer cost-effective.

The APS Residential HVAC program has an existing budget of \$2,801,000 per year. The changes proposed by APS and recommended by Staff will not have a known measurable effect on program spending or APS' DSM budget. This item does not request approval of any new DSM spending by APS. This document focuses on changes to the existing Residential HVAC program to bring it back to cost-effectiveness.

## **PROGRAM COST EFFECTIVENESS PROBLEMS**

The Commission's 1991 Resource Planning Decision established the Societal Cost Test as the methodology to be used for determining the cost-effectiveness of a DSM program. Under

the Societal Cost Test, in order to be cost-effective, the ratio of benefits to costs must be greater than one. That is, the incremental benefits to society of a program must exceed the incremental costs of having the program in place. Societal costs for a DSM program include the cost of the measure and the cost of implementing the program, excluding rebates. The societal benefits of a program include deferred or avoided generation capacity and energy costs. Other benefits of a program may include reduced water consumption and air emissions, although these benefits may not be monetized.

In late 2008, while performing its analysis on APS' application for approval of its DSM Portfolio Plan Update for 2008 through 2010, Staff conducted its Societal Cost Test on all APS Residential DSM programs. Staff obtained actual Residential HVAC kW and kWh savings statistics that had been gathered in the field by APS' Measurement, Evaluation, and Research ("MER") contractor. The actual measured energy and demand savings were lower than those that had been used in Staff's previous analyses before actual MER findings were available. Because the actual measured savings were lower than expected, and perhaps for other contributing reasons, the Residential HVAC program's air-conditioning and heat pump equipment replacement measures did not prove to be cost-effective in Staff's Societal Cost Tests.

Other Residential HVAC program measures for quality installation of equipment and for duct repair and replacement *did* prove to be cost-effective.

On September 30, 2008, APS issued its Measurement, Evaluation, and Research Final Report. This two-inch thick report contains many details and conclusions about all of APS' DSM programs and was written by APS' MER contractor, Summit Blue Consulting, LLC ("Summit Blue"). APS contacted Staff and pointed out that its MER contractor had also come to the conclusion that the Residential HVAC program equipment replacement measures were not cost-effective. Summit Blue documented its findings in its MER Final Report.

These events caused Staff to recommend that APS modify its Residential HVAC program, substitute another DSM program for residential customers, or simply terminate the program. The Commission adopted Staff's recommendation and language in the eighth Ordering paragraph of Decision No. 70666 at p. 18, lines 25-27, through p. 19, lines 1-2.

#### **APS RECOMMENDED MODIFICATIONS TO THE RESIDENTIAL HVAC PROGRAM**

APS suggested changes to its Residential HVAC program to return it to cost-effectiveness. APS states that 40 to 50 percent of a typical residential customer's annual bill is from cooling and heating, and the Company wants to continue to offer a DSM program that helps its customers directly mitigate that usage.

APS' suggested changes to its Residential HVAC program are summarized as follows:

1. Combine the Residential HVAC equipment rebates with the QI rebate.

2. Offer the combined rebates only through the APS Qualified Contractor network.
3. Reduce the current minimum Energy Efficiency Ratio ("EER") requirement to 10.8 for all Seasonal Energy Efficiency Ratio ("SEER") levels.
4. Adopt a revised incentive structure, as detailed in Table 1 below.

Table 1

<b>Arizona Public Service Company Recommended Residential HVAC DSM Program Incentive Levels</b>			
	Quality Installation with Standard Equipment (13 SEER, 10.8 EER)	Quality Installation with Energy Eff. Equipment (14-16 SEER, 10.8 EER)	Quality Installation with Energy Eff. Equipment (17+ SEER, 10.8 EER)
Customer Incentive	\$175	\$425	\$575
Contractor Incentive	\$50	\$50	\$50
Total Incentive	\$225	\$475	\$625

## STAFF ANALYSIS AND DISCUSSION

Staff agrees with APS that the Residential HVAC program is an important offering to the Company's customers to help them mitigate the 40-50 percent of their electric bill that reflects home heating and cooling. The potential for energy and demand savings is also substantial. Staff, therefore, believes that efforts to return the program to cost-effectiveness are worthwhile.

The first three years of this program resulted in a lifetime energy savings of 260,365 MWh and a demand savings of 7.12 MW. Other environmental benefits include a savings of 1,120 lbs. of sulphur oxide (SO<sub>x</sub>), 44,783 lbs. of nitrogen oxide (NO<sub>x</sub>), 238.8 million lbs of carbon dioxide (CO<sub>2</sub>), 6,171 lbs. of particulate matter (PM<sub>10</sub>), and 60.7 million gallons of water (H<sub>2</sub>O).

Staff generally concurs with APS' proposed changes to bring the program back to cost-effectiveness. Each of APS' four proposed changes is discussed below:

### ***Combine the Residential HVAC Equipment Rebates with the QI Rebate***

Combining the equipment rebate with the QI rebate is both a logical way to improve the Residential HVAC program, and it is a substantive and very real change to the way this program would be conducted.

Every rebated installation would *require* a quality install which includes 1) a measurement and unit sizing calculation (Manual J calculation), 2) a refrigeration charge check, and 3) an air flow test. Results of the refrigeration charge check and the air flow test would be reported on the actual rebate form. A copy of Manual J calculation work papers or a laptop computer printout would be required to accompany the rebate form to qualify for a rebate.

All of these QI processes are important if the efficiencies built into an air conditioner or heat pump are to be realized. The sizing measurement and calculation are particularly important as an oversized unit will result in the unit using too much electricity as well as uneven heating and cooling characterized by the unit cycling too often and producing bursts of heating or cooling. Efficiencies that are built into new high-efficiency units are realized with long constant runs of properly sized equipment.

Many replacement air conditioners and heat pumps installed in APS' service territory are oversized and result in inefficient electrical usage. A study APS had performed by Proctor Engineering concluded that the units in its study were oversized by 153 percent. APS' intent with the Residential HVAC program is to transform the market toward the installation of properly sized air conditioning and heat pump units as opposed to the current mainstream practice of quickly installing a new oversized unit and moving to the next installation. Oversizing assures the unscrupulous contractor that the homeowner will not call back complaining of insufficient heating or cooling that could possibly require replacement with a larger unit at the contractor's expense.

***Offer the Combined Rebates Only through the APS "Qualified Contractor" Network***

Once again, this proposed change is a substantive and very real change to the way this program would be conducted. In 2008, only 46 percent of the HVAC installs receiving an APS rebate were installed by an APS "Qualified Contractor."

Qualified Contractor companies are certified by APS only after their technicians have met requirements in two areas: 1) education of technicians, and 2) company membership in the Arizona Heat Pump Council. The education requirement mandates that 10 percent of the company's technicians are "master technicians." Master technicians have completed all 12 of the required Arizona Heat Pump Council classes. A continuing education requirement further mandates that the company's technicians as a whole complete on average a minimum of one class per technician per year. The 12 classes are promoted and supported by APS but conducted by the Arizona Heat Pump Council. Contractor company membership in the Arizona Heat Pump Council provides assurances that 1) a dispute resolution mechanism including arbitration is in place; 2) a pledge of performance has been accepted and signed; 3) the company is in good standing with the Better Business Bureau and the Registrar of Contractors; 4) the company is licensed, bonded, and insured; and 5) the company has a current retail sales tax privilege license. Arizona Heat Pump Council members are also required to be members of the Electric League of Arizona and to pay dues to belong to those organizations.

Realizing that this is a substantive change in the way the program would be carried out, APS is currently engaged in rapidly training and qualifying heating and air conditioning firms as Qualified Contractors both in the Phoenix area and outside of metropolitan Phoenix. Currently, APS has about 73 such firms that are part of its Residential HVAC replacement program. Of that total, 61 operate in the Phoenix metropolitan area and 12 are outside Phoenix. APS has

estimated that it will need at least 60 of the *largest* contractors that participated in the program statewide in 2008 in order to achieve the budgeted volume for 2009.

It is possible that in the short term, the volume of rebated HVAC replacements could go down while additional contracting companies are being recruited and trained for the program. Adoption of these program changes would also create a need to rapidly inform customers and contractors of the changes in how the program operates.

Another change that APS is proposing is to designate \$50 of the rebate to the contractor as shown on Table 1. This is to provide an incentive to contractors to participate in the program by compensating them for the time away from work for training technicians, for the additional administrative work of the quality installation, and for processing applications. A focus group that APS held with contractors indicates that they value the proposed incentive structure. Staff believes the contractor incentive will help APS recruit the needed contractors, and that those contractors will be instrumental in transforming the market in terms of how central air conditioning and heat pump equipment is installed.

#### ***Reduce the Minimum EER Requirement to 10.8 for all SEER Levels***

APS has had difficulty since the inception of the Residential HVAC program in defining an appropriate EER level to qualify for a rebate. There has also been confusion in the past among contractors because of a lack of readily available EER values for a given piece of HVAC equipment. APS has successfully mitigated the second problem by creating and advertising a telephone number that customers or contractors can call to obtain the SEER and EER ratings. Problems in setting an appropriate EER level, however, continue to persist.

The problems in setting an appropriate minimum EER level are most likely unique to Arizona and possibly other hot desert areas. EER level is relevant to a desert climate as it is a measure of how efficiently a cooling system will operate when the outdoor temperature is at 95° F. A higher EER means the system is more efficient. The SEER level, by contrast, measures how efficiently a residential central cooling system (air conditioner or heat pump) will operate over an entire cooling season. A higher SEER also means the system is more efficient.

Equipment manufacturers have focused on optimizing their equipment for higher SEER ratings relevant to most climates in the country. This practice, however, creates an issue in the desert southwest because some of the equipment designs used to increase the SEER level can reduce the EER rating. This is particularly true of dual compressor or dual speed compressor models that have gained favor recently as highly efficient units that exhibit very substantial savings of energy (kWh) and currently dominate the high-efficiency market (16 SEER and above). These highly-efficient units sometimes do not qualify for rebates because the EER is too low. Contractors and customers have reported confusion and frustration when these highly efficient models do not qualify for a rebate. It is for this reason that APS has proposed lowering the minimum EER requirement from current levels of 11.5 EER for 14-15 SEER units and 12.25 EER for 16 and above SEER units to 10.8 EER for all SEER levels.

Staff supports lowering the EER requirement to 10.8 EER for all SEER levels but also acknowledges that these high SEER dual compressor units do not save proportionately as much demand (kW) as they save energy (kWh). However, they do save incrementally more demand as the efficiency levels go up. The demand savings is simply not proportional to the very substantial energy savings. Further, Staff believes that these units should be included in the program because of their extraordinary energy savings potential and their incremental demand savings.

Staff was interested in confirming that an EER minimum level of 10.8 would still be an effective tool for eliminating HVAC units that do not exhibit acceptable levels of cooling efficiency in severe (hot) conditions. To prove that premise, Staff used actual APS historical data from the past. In response to a Staff data request, APS reported that of 4,600 applications received in 2006 and 2007, over 900 (about 20 percent) *would have* been eliminated from receiving a rebate had the 10.8 EER requirement been in place at that time. Staff believes it is reasonable to conclude that, while less restrictive than the current EER requirement, the minimum level of 10.8 would be an effective tool to prevent inefficient units from receiving a rebate.

***Adopt a Revised Incentive Structure as Illustrated in Table 1***

APS' current incentive structure for its Residential HVAC program offers separate incentives for equipment replacement and for quality installation. Units with a SEER rating of 14 or 15 and an EER rating of 11.5 or greater qualify for a \$250 rebate. Units having a SEER rating of 16 or greater and an EER of 12.25 qualify for a \$400 rebate. The optional QI measure offers an additional \$100 rebate to the homeowner that chooses a qualified contractor to perform a quality installation of the equipment.

Staff believes the APS proposed structure illustrated in Table 1 is an improvement, particularly with regard to the contractor receiving a portion of the rebate and the lowering of the EER requirement. However, Staff also believes that the higher efficiency units do not require quite as much incremental incentive as APS proposes, because the substantial energy savings and the incremental demand savings should provide a large measure of incentive to customers to purchase the equipment. The higher SEER units are also less cost-effective than the lower SEER units. Staff recommends that APS' proposed Customer Incentive for the 17 and over SEER levels be decreased from APS' proposed level of \$575 to \$525, thus decreasing the Total Incentive for this group from \$625 to \$575. Staff's recommended incentive structure is illustrated in Table 2.

Table 2

<b>Staff Recommended</b> <b>Residential HVAC DSM Program</b> <b>Incentive Levels</b>			
	Quality Installation with Standard Equipment (13 SEER, 10.8 EER)	Quality Installation with Energy Eff. Equipment (14-16 SEER, 10.8 EER)	Quality Installation with Energy Eff. Equipment (17+ SEER, 10.8 EER)
Customer Incentive	\$175	\$425	<b>\$525</b>
Contractor Incentive	\$50	\$50	\$50
Total Incentive	\$225	\$475	<b>\$575</b>

SEER 13 is now the federal minimum standard and the base unit from which energy-efficient units' energy savings and incremental cost are measured. APS has proposed a significant change to its proposed incentive structure by advocating payment of an incentive for a quality install of a base-efficiency unit (SEER 13) that is not categorized as an "energy-efficient" unit.

According to APS, it included the 13 SEER measure in order to make the program more accessible to lower income customers. Indeed, based on information supplied to APS by local contractors, 13 SEER units comprise almost half of the residential HVAC replacements that are performed. Staff finds it easy to believe that, particularly during difficult recessionary times, customers might choose the lower cost solution to a worn out air conditioner or heat pump even if more efficient units are available. The large proportion of HVAC replacements that are 13 SEER units represents a significant lost opportunity for energy efficiency when one considers that these units are not "quality installed." There is no incentive currently for quality installation for a 13 SEER unit.

When Staff investigated the proposed 13 SEER incentive, it discovered that the incentive was for the quality install only. The equipment replacement portion of the installation would receive no incentive. The incremental cost is the cost for the quality installation only, \$330. Likewise, the savings accrue from the quality installation only. Additionally, Qualified Contractors could maintain a single procedure (a quality install procedure) that could be used on all equipment installations the company performs. Staff believes that standardized equipment installation and sales procedures could introduce new efficiencies and help to "transform the market" toward making quality installation the standard practice.

Staff was concerned that the customer could possibly move up from a 13 SEER unit to a more efficient HVAC unit for the same or less cost when rebates are considered. Staff believes that the Company should not promote lower efficiency equipment when the consumer could obtain higher efficiency equipment at the same or lower cost. Staff performed the analysis shown in Table 3 that disaggregates the numbers for a typical 4 ton unit for 13-15 SEER levels and demonstrates that the costs and incentives *are* constructed properly to provide reasonable alternatives to APS consumers where additional cost purchases additional efficiency.

Table 3

<b>After Rebate Incremental Cost to APS Customer</b> <b>Typical 4-Ton HVAC Unit 13 to 15 SEER</b> <b>(Compared to 13 SEER Without QI)</b>				
	(13 SEER, No QI)	(13 SEER/W QI)	(14 SEER/W QI)	(15 SEER/W QI)
QI Incremental Cost	\$0	\$330	\$330	\$330
Equipment Incr. Cost	\$0	\$0	\$458	\$788
QI Rebate	\$0	(\$175)	(\$175)	(\$175)
Equip. Rebate to Cust.	\$0	\$0	(\$250)	(\$250)
Total Incremental Cost	\$0	\$155	\$363	\$693
The Rebates Shown as (\$175) and (\$250) Are Components of the \$425 Rebate for 14-16 SEER shown on Table 2				

Based on the analysis presented in Table 3, Staff's concerns were alleviated and Staff believes that the APS-proposed incentive levels for the lower SEER levels including the QI only incentive are constructed properly to send appropriate price signals to customers. Because of the large number of 13 SEER installs that have been done in the past and that will likely be done in the future, Staff believes that it is appropriate to offer the QI incentive on standard equipment installs to provide an opportunity for low income customers to participate in energy efficiency and to capture a significant pool of energy savings that would otherwise be lost.

#### PROGRAM RETURN TO COST EFFECTIVENESS

Staff conducted its Societal Cost Test analysis on seven air conditioner replacement measures from 13 to 19 SEER and on seven heat pump replacement measures from 13 to 19 SEER. In all cases except the 13 SEER measures, the equipment replacement and the quality install were combined as a single measure such that incremental costs were combined and savings from both components were combined. All measures returned a benefit cost ratio of 1.00 or above as shown on Table 4.

Table 4

<b>APS Residential HVAC Program</b> <b>Staff Societal Cost Test Results</b>							
SEER	13	14	15	16	17	18	19
Air Conditioners	1.64	1.42	1.30	1.00	1.03	1.00	1.02
Heat Pumps	1.64	1.45	1.35	1.06	1.09	1.07	1.09

It is clear that the higher SEER units exhibit a lower cost effectiveness ratio than the lower SEER units. This is not because of a lack of significant energy and demand savings. It is because the dual compressor units that are prevalent in these higher SEER categories carry significantly higher incremental costs compared with the lower SEER units.

#### OTHER RESIDENTIAL HVAC PROGRAM ISSUES

Staff believes that APS, its Qualified Contractors, and its Residential HVAC program participant customers can all adapt to the significant changes proposed to return the program to

cost effectiveness. Staff also believes, however, that it will be a difficult transition that could temporarily reduce the number of participants. The change to using only APS Qualified Contractors is particularly significant to contractors that are not Qualified Contractors, and to APS customers who must ensure that they choose a Qualified Contractor through whom they can obtain an APS rebate.

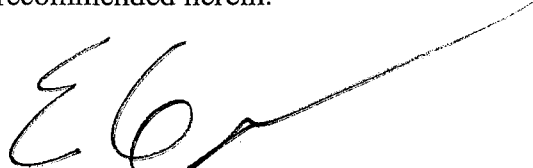
Staff is concerned with APS' current procedures to refer Qualified Contractors to customers through the telephone or the APS website. In both cases, the request goes to the Electric League of Arizona, which then furnishes the customer with the name of three qualified contractors. Many individuals are interested in using a contractor that has been recommended to them by a friend or relative who has used the contractor successfully. In other instances, customers may want to deal with a local contractor in their community or suburb to keep the dollars in the local economy or to deal with a contractor that can arrive quickly if a problem occurs. Other individuals may see a contractor advertisement and wish to determine if that contractor company is a Qualified Contractor. Under current procedures, these considerations cannot be readily met. Furthermore, many customers may simply want to be reassured that the contractors to whom they have been referred are indeed on the list of Qualified Contractors.

Because all program participants must use a Qualified Contractor to participate in the rebate program and because of the other considerations discussed above, Staff believes that it is imperative that APS revise and improve its Qualified Contractor referral procedures to better accommodate its customers. Staff believes, for example, that a list of all Qualified Contractors should be readily available on the website for easy access by all. Staff, however, is somewhat reluctant to recommend specific modifications because APS is in a better position to know what can or cannot be done, and there could be legal or other implications that are more obvious to APS than to Staff.

Staff recommends that APS conduct a study on how it might update, revise, and improve its Qualified Contractor referral procedures to better accommodate its customers, implement the results of that study within six months of an Order in this matter, and inform the Commission when such procedures are implemented by submitting a letter to Docket Control. Staff further believes that a customer focus group could be utilized to provide valuable input to the study.

**STAFF RESIDENTIAL HVAC PROGRAM RECOMMENDATION**

Staff recommends that APS' proposed modifications to its Residential HVAC DSM program, to return the program to cost-effectiveness, be adopted with the changes and additions recommended herein.

A handwritten signature in black ink, appearing to read 'EGJ', followed by a long horizontal line extending to the right.

Ernest G. Johnson  
Director  
Utilities Division

EGJ:JDA:lhv\JFW

ORIGINATOR: Jerry D. Anderson

1                   **BEFORE THE ARIZONA CORPORATION COMMISSION**

2   KRISTIN K. MAYES  
3       Chairman

4   GARY PIERCE  
5       Commissioner

6   PAUL NEWMAN  
7       Commissioner

8   SANDRA D. KENNEDY  
9       Commissioner

10   BOB STUMP  
11       Commissioner

12   IN THE MATTER OF THE APPLICATION )  
13   OF THE ARIZONA PUBLIC SERVICE    }  
14   COMPANY FOR APPROVAL OF           }  
15   REVISIONS TO ITS RESIDENTIAL       }  
16   EXISTING HOMES HEATING,           }  
17   VENTILATION AND AIR CONDITIONING }  
18   EFFICIENCY DEMAND-SIDE           }  
19   MANAGEMENT PROGRAM AS           }  
20   REQUIRED BY DECISION NO. 70666    }

DOCKET NO. E-01345A-07-0712

DECISION NO. \_\_\_\_\_

ORDER

21   Open Meeting  
22   March 31 – April 1, 2009  
23   Phoenix, Arizona

24   BY THE COMMISSION:

25                   FINDINGS OF FACT

26           1.     Arizona Public Service Company (“APS” or the “Company”) is certificated to  
27   provide electric service as a public service corporation in the State of Arizona.

28           2.     On January 16, 2009, the Arizona Public Service Company (“APS” or “the  
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2 benefits of a program may include reduced water consumption and air emissions, although these  
3 benefits may not be monetized.

4 13. In late 2008, while performing its analysis on APS' application for approval of its  
5 DSM Portfolio Plan Update for 2008 through 2010, Staff conducted its Societal Cost Test on all  
6 APS Residential DSM programs. Staff obtained actual Residential HVAC kW and kWh savings  
7 statistics that had been gathered in the field by APS' Measurement, Evaluation, and Research  
8 ("MER") contractor. The actual measured energy and demand savings were lower than those that  
9 had been used in Staff's previous analyses before actual MER findings were available. Because  
10 the actual measured savings were lower than expected, and perhaps for other contributing reasons,  
11 the Residential HVAC program's air-conditioning and heat pump equipment replacement  
12 measures did not prove to be cost-effective in Staff's Societal Cost Tests.

13 14. Other Residential HVAC program measures for quality installation of equipment  
14 and for duct repair and replacement did prove to be cost-effective.

15 15. On September 30, 2008, APS issued its Measurement, Evaluation, and Research  
16 Final Report. This two-inch thick report contains many details and conclusions about all of APS'  
17 DSM programs and was written by APS' MER contractor, Summit Blue Consulting, LLC  
18 ("Summit Blue"). APS contacted Staff and pointed out that its MER contractor had also come to  
19 the conclusion that the Residential HVAC program equipment replacement measures were not  
20 cost-effective. Summit Blue documented its findings in its MER Final Report.

21 16. These events caused Staff to recommend that APS modify its Residential HVAC  
22 program, substitute another DSM for residential customers, or simply terminate the program. The  
23 Commission adopted Staff's recommendation and language in the eighth Ordering paragraph of  
24 Decision No. 70666 at Page 18, lines 25-27, through Page 19, lines 1-2.

25 **APS RECOMMENDED MODIFICATIONS TO THE RESIDENTIAL HVAC PROGRAM**

26 17. APS suggested changes to its Residential HVAC program to return it to cost-  
27 effectiveness. APS states that 40 to 50 percent of a typical residential customer's annual bill is  
28 ...

from cooling and heating, and the Company wants to continue to offer a DSM program that helps its customers directly mitigate that usage.

18. APS' suggested changes to its Residential HVAC program are summarized as follows:

- a. Combine the Residential HVAC equipment rebates with the QI rebate.
- b. Offer the combined rebates only through the APS Qualified Contractor network.
- c. Reduce the current minimum Energy Efficiency Ratio ("EER") requirement to 10.8 for all Seasonal Energy Efficiency Ratio ("SEER") levels.
- d. Adopt a revised incentive structure, as detailed in Table 1 below.

Table 1

Arizona Public Service Company Recommended Residential HVAC DSM Program Incentive Levels			
	Quality Installation with Standard Equipment (13 SEER, 10.8 EER)	Quality Installation with Energy Eff. Equipment (14-16 SEER, 10.8 EER)	Quality Installation with Energy Eff. Equipment (17+ SEER, 10.8 EER)
Customer Incentive	\$175	\$425	\$575
Contractor Incentive	\$50	\$50	\$50
Total Incentive	\$225	\$475	\$625

## STAFF ANALYSIS AND DISCUSSION

19. Staff agrees with APS that the Residential HVAC program is an important offering to the Company's customers to help them mitigate the 40-50 percent of their electric bill that reflects home heating and cooling. The potential for energy and demand savings is also substantial. Staff, therefore, believes that efforts to return the program to cost-effectiveness are worthwhile.

20. The first three years of this program resulted in a lifetime energy savings of 260,365 MWh and a demand savings of 7.12 MW. Other environmental benefits include a savings of 1,120 lbs. of sulphur oxide (SOx), 44,783 lbs. of nitrogen oxide (NOx), 238.8 million lbs of carbon dioxide (CO2), 6,171 lbs. of particulate matter (PM10), and 60.7 million gallons of water (H2O).

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21. Staff generally concurs with APS' proposed changes to bring the program back to cost-effectiveness. Each of APS' four proposed changes is discussed below:

Combine the Residential HVAC Equipment Rebates with the QI Rebate

22. Combining the equipment rebate with the QI rebate is both a logical way to improve the Residential HVAC program, and it is a substantive and very real change to the way this program would be conducted.

23. Every rebated installation would require a quality install which includes 1) a measurement and unit sizing calculation (Manual J calculation), 2) a refrigeration charge check, and 3) an air flow test. Results of the refrigeration charge check and the air flow test would be reported on the actual rebate form. A copy of Manual J calculation work papers or a laptop computer printout would be required to accompany the rebate form to qualify for a rebate.

24. All of these QI processes are important if the efficiencies built into an air conditioner or heat pump are to be realized. The sizing measurement and calculation are particularly important as an oversized unit will result in the unit using too much electricity as well as uneven heating and cooling characterized by the unit cycling too often and producing bursts of heating or cooling. Efficiencies that are built into new high-efficiency units are realized with long constant runs of properly sized equipment.

25. Many replacement air conditioners and heat pumps installed in APS' service territory are oversized and result in inefficient electrical usage. A study APS had performed by Proctor Engineering concluded that the units in its study were oversized by 153 percent. APS' intent with the Residential HVAC program is to transform the market toward the installation of properly sized air conditioning and heat pump units as opposed to the current mainstream practice of quickly installing a new oversized unit and moving to the next installation. Over sizing assures the unscrupulous contractor that the homeowner will not call back complaining of insufficient heating or cooling that could possibly require replacement with a larger unit at the contractor's expense.

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2 Offer the Combined Rebates Only through the APS "Qualified Contractor" Network

3       26.     Once again, this proposed change is a substantive and very real change to the way  
4 this program would be conducted. In 2008, only 46 percent of the HVAC installs receiving an  
5 APS rebate were installed by an APS "Qualified Contractor."

6       27.     Qualified Contractor companies are certified by APS only after their technicians  
7 have met requirements in two areas: 1) education of technicians, and 2) company membership in  
8 the Arizona Heat Pump Council. The education requirement mandates that 10 percent of the  
9 company's technicians are "master technicians." Master technicians have completed all 12 of the  
10 required Arizona Heat Pump Council classes. A continuing education requirement further  
11 mandates that the company's technicians as a whole complete on average a minimum of one class  
12 per technician per year. The 12 classes are promoted and supported by APS but conducted by the  
13 Arizona Heat Pump Council. Contractor company membership in the Arizona Heat Pump Council  
14 provides assurances that 1) a dispute resolution mechanism including arbitration is in place; 2) a  
15 pledge of performance has been accepted and signed; 3) the company is in good standing with the  
16 Better Business Bureau and the Registrar of Contractors; 4) the company is licensed, bonded, and  
17 insured; and 5) the company has a current retail sales tax privilege license. Arizona Heat Pump  
18 Council members are also required to be members of the Electric League of Arizona and to pay  
19 dues to belong to those organizations.

20       28.     Realizing that this is a substantive change in the way the program would be carried  
21 out, APS is currently engaged in rapidly training and qualifying heating and air conditioning firms  
22 as Qualified Contractors both in the Phoenix area and outside of metropolitan Phoenix. Currently,  
23 APS has about 73 such firms that are part of its Residential HVAC replacement program. Of that  
24 total, 61 operate in the Phoenix metropolitan area and 12 are outside Phoenix. APS has estimated  
25 that it will need at least 60 of the largest contractors that participated in the program statewide in  
26 2008 in order to achieve the budgeted volume for 2009.

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29. It is possible that in the short term, the volume of rebated HVAC replacements could go down while additional contracting companies are being recruited and trained for the program. Adoption of these program changes would also create a need to rapidly inform customers and contractors of the changes in how the program operates.

30. Another change that APS is proposing is to designate \$50 of the rebate to the contractor as shown on Table 1. This is to provide an incentive to contractors to participate in the program by compensating them for the time away from work for training technicians, for the additional administrative work of the quality installation, and for processing applications. A focus group that APS held with contractors indicates that they value the proposed incentive structure. Staff believes the contractor incentive will help APS recruit the needed contractors, and that those contractors will be instrumental in transforming the market in terms of how central air conditioning and heat pump equipment is installed.

Reduce the Minimum EER Requirement to 10.8 for all SEER Levels

31. APS has had difficulty since the inception of the Residential HVAC program in defining an appropriate EER level to qualify for a rebate. There has also been confusion in the past among contractors because of a lack of readily available EER values for a given piece of HVAC equipment. APS has successfully mitigated the second problem by creating and advertising a telephone number that customers or contractors can call to obtain the SEER and EER ratings. Problems in setting an appropriate EER level, however, continue to persist.

32. The problems in setting an appropriate minimum EER level are most likely unique to Arizona and possibly other hot desert areas. EER level is relevant to a desert climate as it is a measure of how efficiently a cooling system will operate when the outdoor temperature is at 95° F. A higher EER means the system is more efficient. The SEER level, by contrast, measures how efficiently a residential central cooling system (air conditioner or heat pump) will operate over an entire cooling season. A higher SEER also means the system is more efficient.

33. Equipment manufacturers have focused on optimizing their equipment for higher SEER ratings relevant to most climates in the country. This practice, however, creates an issue in the desert southwest because some of the equipment designs used to increase the SEER level can

1 reduce the EER rating. This is particularly true of dual compressor or dual speed compressor  
2 models that have gained favor recently as highly efficient units that exhibit very substantial  
3 savings of energy (kWh) and currently dominate the high-efficiency market (16 SEER and above).  
4 These highly-efficient units sometimes do not qualify for rebates because the EER is too low.  
5 Contractors and customers have reported confusion and frustration when these highly efficient  
6 models do not qualify for a rebate. It is for this reason that APS has proposed lowering the  
7 minimum EER requirement from current levels of 11.5 EER for 14-15 SEER units and 12.25 EER  
8 for 16 and above SEER units, to 10.8 EER for all SEER levels.

9       34. Staff supports lowering the EER requirement to 10.8 EER for all SEER levels but  
10 also acknowledges that these high SEER dual compressor units do not save proportionately as  
11 much demand (kW) as they save energy (kWh). However, they do save incrementally more  
12 demand as the efficiency levels go up. The demand savings is simply not proportional to the very  
13 substantial energy savings. Further, Staff believes that these units should be included in the  
14 program because of their extraordinary energy savings potential and their incremental demand  
15 savings.

16       35. Staff was interested in confirming that an EER minimum level of 10.8 would still  
17 be an effective tool for eliminating HVAC units that do not exhibit acceptable levels of cooling  
18 efficiency in severe (hot) conditions. To prove that premise, Staff used actual APS historical data  
19 from the past. In response to a Staff data request, APS reported that of 4,600 applications received  
20 in 2006 and 2007, over 900 (about 20 percent) would have been eliminated from receiving a rebate  
21 had the 10.8 EER requirement been in place at that time. Staff believes it is reasonable to  
22 conclude that, while less restrictive than the current EER requirement, the minimum level of 10.8  
23 would be an effective tool to prevent inefficient units from receiving a rebate.

24 *Adopt a Revised Incentive Structure as Illustrated in Table 1*

25       36. APS' current incentive structure for its Residential HVAC program offers separate  
26 incentives for equipment replacement and for quality installation. Units with a SEER rating of 14  
27 or 15 and an EER rating of 11.5 or greater qualify for a \$250 rebate. Units having a SEER rating  
28 of 16 or greater and an EER of 12.25 qualify for a \$400 rebate. The optional QI measure offers an

1 additional \$100 rebate to the homeowner that chooses a qualified contractor to perform a quality  
2 installation of the equipment.

3        37. Staff believes the APS proposed structure illustrated in Table 1 is an improvement,  
4 particularly with regard to the contractor receiving a portion of the rebate and the lowering of the  
5 EER requirement. However, Staff also believes that the higher efficiency units do not require  
6 quite as much incremental incentive as APS proposes, because the substantial energy savings and  
7 the incremental demand savings should provide a large measure of incentive to customers to  
8 purchase the equipment. The higher SEER units are also less cost-effective than the lower SEER  
9 units. Staff has recommended that APS' proposed Customer Incentive for the 17 and over SEER  
10 levels be decreased from APS' proposed level of \$575 to \$525, thus decreasing the Total Incentive  
11 for this group from \$625 to \$575. Staff's recommended incentive structure is illustrated in  
12 Table 2.

Table 2

Staff Recommended Residential HVAC DSM Program Incentive Levels			
	Quality Installation with Standard Equipment (13 SEER, 10.8 EER)	Quality Installation with Energy Eff. Equipment (14-16 SEER, 10.8 EER)	Quality Installation with Energy Eff. Equipment (17+ SEER, 10.8 EER)
Customer Incentive	\$175	\$425	\$525
Contractor Incentive	\$50	\$50	\$50
Total Incentive	\$225	\$475	\$575

19        38. SEER 13 is now the federal minimum standard and the base unit from which  
20 energy-efficient units' energy savings and incremental cost are measured. APS has proposed a  
21 significant change to its proposed incentive structure by advocating payment of an incentive for a  
22 quality install of a base-efficiency unit (SEER 13) that is not categorized as an "energy-efficient"  
23 unit.

24        39. According to APS, it included the 13 SEER measure in order to make the program  
25 more accessible to lower income customers. Indeed, based on information supplied to APS by  
26 local contractors, 13 SEER units comprise almost half of the residential HVAC replacements that  
27 are performed. Staff finds it easy to believe that, particularly during difficult recessionary times,  
28 customers might choose the lower cost solution to a worn out air conditioner or heat pump even if

more efficient units are available. The large proportion of HVAC replacements that are 13 SEER units represents a significant lost opportunity for energy efficiency when one considers that these units are not "quality installed." There is no incentive currently for quality installation for a 13 SEER unit.

40. When Staff investigated the proposed 13 SEER incentive, it discovered that the incentive was for the quality install only. The equipment replacement portion of the installation would receive no incentive. The incremental cost is the cost for the quality installation only, \$330. Likewise, the savings accrue from the quality installation only. Additionally, Qualified Contractors could maintain a single procedure (a quality install procedure) that could be used on all equipment installations the company performs. Staff believes that standardized equipment installation and sales procedures could introduce new efficiencies and help to "transform the market" toward making quality installation the standard practice.

41. Staff was concerned that the customer could possibly move up from a 13 SEER unit to a more efficient HVAC unit for the same or less cost when rebates are considered. Staff believes that the Company should not promote lower efficiency equipment when the consumer could obtain higher efficiency equipment at the same or lower cost. Staff performed the analysis shown in Table 3 that disaggregates the numbers for a typical 4 ton unit for 13-15 SEER levels and demonstrates that the costs and incentives are constructed properly to provide reasonable alternatives to APS consumers where additional cost purchases additional efficiency.

Table 3

After Rebate Incremental Cost to APS Customer Typical 4-Ton HVAC Unit 13 to 15 SEER (Compared to 13 SEER Without QI)				
	(13 SEER, No QI)	(13 SEER/W QI)	(14 SEER/W QI)	(15 SEER/W QI)
QI Incremental Cost	\$0	\$330	\$330	\$330
Equipment Incr. Cost	\$0	\$0	\$458	\$788
QI Rebate	\$0	(\$175)	(\$175)	(\$175)
Equip. Rebate to Cust.	\$0	\$0	(\$250)	(\$250)
Total Incremental Cost	\$0	\$155	\$363	\$693
The Rebates Shown as (\$175) and (\$250) Are Components of the \$425 Rebate for 14-16 SEER shown on Table 2				

42. Based on the analysis presented in Table 3, Staff's concerns were alleviated and Staff believes that the APS-proposed incentive levels for the lower SEER levels including the QI only incentive are constructed properly to send appropriate price signals to customers. Because of

the large number of 13 SEER installs that have been done in the past and that will likely be done in the future, Staff believes that it is appropriate to offer the QI incentive on standard equipment installs to provide an opportunity for low income customers to participate in energy efficiency and to capture a significant pool of energy savings that would otherwise be lost.

#### **PROGRAM RETURN TO COST EFFECTIVENESS**

43. Staff conducted its Societal Cost Test analysis on seven air conditioner replacement measures from 13 to 19 SEER and on seven heat pump replacement measures from 13 to 19 SEER. In all cases except the 13 SEER measures, the equipment replacement and the quality install were combined as a single measure such that incremental costs were combined and savings from both components were combined. All measures returned a benefit cost ratio of 1.00 or above as shown on Table 4.

Table 4

APS Residential HVAC Program Staff Societal Cost Test Results							
SEER	13	14	15	16	17	18	19
Air Conditioners	1.64	1.42	1.30	1.00	1.03	1.00	1.02
Heat Pumps	1.64	1.45	1.35	1.06	1.09	1.07	1.09

44. It is clear that the higher SEER units exhibit a lower cost effectiveness ratio than the lower SEER units. This is not because of a lack of significant energy and demand savings. It is because the dual compressor units that are prevalent in these higher SEER categories carry significantly higher incremental costs compared with the lower SEER units.

#### **OTHER RESIDENTIAL HVAC PROGRAM ISSUES**

45. Staff believes that APS, its Qualified Contractors, and its Residential HVAC program participant customers can all adapt to the significant changes proposed to return the program to cost effectiveness. Staff also believes, however, that it will be a difficult transition that could temporarily reduce the number of participants. The change to using only APS Qualified Contractors is particularly significant to contractors that are not Qualified Contractors, and to APS customers who must ensure that they choose a Qualified Contractor through whom they can obtain an APS rebate.

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1           46.     Staff is concerned with APS' current procedures to refer Qualified Contractors to  
2 customers through the telephone or the APS website. In both cases, the request goes to the  
3 Electric League of Arizona, which then furnishes the customer with the name of three qualified  
4 contractors. Many individuals are interested in using a contractor that has been recommended to  
5 them by a friend or relative who has used the contractor successfully. In other instances,  
6 customers may want to deal with a local contractor in their community or suburb to keep the  
7 dollars in the local economy or to deal with a contractor that can arrive quickly if a problem  
8 occurs. Other individuals may see a contractor advertisement and wish to determine if that  
9 contractor company is a Qualified Contractor. Under current procedures, these considerations  
10 cannot be readily met. Furthermore, many customers may simply want to be reassured that the  
11 contractors to whom they have been referred are indeed on the list of Qualified Contractors.

12           47.     Because all program participants must use a Qualified Contractor to participate in  
13 the rebate program and because of the other considerations discussed above, Staff believes that it is  
14 imperative that APS revise and improve its Qualified Contractor referral procedures to better  
15 accommodate its customers. Staff believes, for example, that a list of all Qualified Contractors  
16 should be readily available on the website for easy access by all. Staff, however, is somewhat  
17 reluctant to recommend specific modifications because APS is in a better position to know what  
18 can or cannot be done, and there could be legal or other implications that are more obvious to APS  
19 than to Staff.

20           48.     Staff has recommended that APS conduct a study on how it might update, revise,  
21 and improve its Qualified Contractor referral procedures to better accommodate its customers,  
22 implement the results of that study within six months of an Order in this matter, and inform the  
23 Commission when such procedures are implemented by submitting a letter to Docket Control.  
24 Staff further believes that a customer focus group could be utilized to provide valuable input to the  
25 study.

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**STAFF RESIDENTIAL HVAC PROGRAM RECOMMENDATION**

49. Staff has recommended that APS' proposed modifications to its Residential HVAC DSM program, to return the program to cost-effectiveness, be adopted with the changes and additions recommended herein.

CONCLUSIONS OF LAW

1. APS is certificated to provide electric service as a public service corporation in the state of Arizona.

2. The Commission has jurisdiction over APS and of the subject matter in this Application.

3. The Commission, having reviewed the application and Staff's Memorandum dated March 19, 2009, concludes that it is in the public interest to approve APS' proposed changes to its Residential HVAC DSM program with certain changes and additions ordered herein.

ORDER

IT IS THEREFORE ORDERED that approval for Arizona Public Service Company's proposed modifications to its Residential HVAC DSM program, to return the program to cost-effectiveness, is hereby granted with the changes and additions ordered below.

IT IS FURTHER ORDERED that Arizona Public Service Company's proposed Customer Incentive for the 17 and over SEER levels shall be decreased from Arizona Public Service Company's proposed level of \$575 to \$525, thus decreasing the Total Incentive for the 17 and over SEER levels from \$625 to \$575.

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1 IT IS FURTHER ORDERED that that Arizona Public Service Company shall conduct a  
2 study on how it might update, revise, and improve its Qualified Contractor referral procedures to  
3 better accommodate its customers, and shall implement the results of that study within six months  
4 of an Order in this matter, and shall inform the Commission when such procedures are  
5 implemented by submitting a letter to Docket Control.

6 IT IS FURTHER ORDERED that this Decision shall become effective immediately.

7 **BY THE ORDER OF THE ARIZONA CORPORATION COMMISSION**

8  
9  
10 CHAIRMAN

COMMISSIONER

11  
12 COMMISSIONER

COMMISSIONER

COMMISSIONER

13  
14 IN WITNESS WHEREOF, I, MICHAEL P. KERNS, Interim  
15 Executive Director of the Arizona Corporation Commission,  
16 have hereunto, set my hand and caused the official seal of  
17 this Commission to be affixed at the Capitol, in the City of  
18 Phoenix, this \_\_\_\_\_ day of \_\_\_\_\_, 2009.

19  
20 \_\_\_\_\_  
21 MICHAEL P. KERNS  
22 INTERIM EXECUTIVE DIRECTOR

23  
24 DISSENT: \_\_\_\_\_

DISSENT: \_\_\_\_\_

25 EGJ:JDA:lhv\JFW  
26  
27  
28

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